Amendments in the Claims

1. (Currently Amended) A system comprising:

a textile sewing apparatus having at least one yarn guide plate defining a plurality of holes through which thread may pass; and

a thread breakage detection apparatus coupled to the textile sewing apparatus, the thread breakage detection apparatus comprising:

a light source operable to generate a light beam;

an emitter in communication with the light source, the emitter operable to emit the light beam, the emitter comprising an emitter lens ~~and a first fiber optic cable comprising proximate and distal ends, the proximate end of the first fiber optic cable in communication with the light source and the distal end of the first fiber optic cable in communication with the emitter lens~~; and

a receiver in communication with the emitter, the receiver operable to receive the light beam emitted from the emitter and to communicate the light beam to a sensor, the receiver comprising a receiving lens ~~and a second fiber optic cable comprising proximate and distal ends, the proximate end of the second fiber optic cable in communication with the receiving lens and the distal end of the second fiber optic cable in communication with the sensor, the receiving lens~~ disposed in facing opposition to the emitter lens, wherein in order to minimize false positives:

_____ the light beam is proximate to the yarn guide plate, and

a distance between the light beam and a thread disposed in one of the plurality of holes defined by the yarn guide plate comprises approximately 10 millimeters.

2. (Original) The system of claim 1, wherein the light beam comprises a wavelength in the infrared range.

3. (Original) The system of claim 1, wherein the receiving lens comprises a diameter, the diameter substantially equal to or less than a diameter of a thread disposed in the textile sewing apparatus.

4. (Original) The system of claim 1, wherein the light beam emitted from the emitter comprises a collimated optical beam.

5. (Original) The system of claim 1, wherein the receiving lens is operable to focus the light beam on a surface of the proximate end of the second fiber optic cable.

6. (Original) The system of claim 1, further comprising a first processor and a second processor, the first processor in communication with the light source, the sensor, and the second processor, the second processor operable to control the textile sewing apparatus.

7. (Original) The system of claim 6, wherein the second processor comprises a relay.

8. (Previously Presented) The system of claim 6, wherein the second processor comprises a microprocessor.

9. (Original) The system of claim 6, wherein the first processor is operable to associate a first value with a quantity of light emitted from the emitter and to associate a second value with a quantity of light received by the receiver.

10. (Original) The system of claim 9, wherein the first processor is operable to compare the first and second values.

11. (Original) The system of claim 10, wherein the first processor is operable to generate a signal associated with the comparison of the first and second values and to communicate the signal to the second processor.

12. (Original) The system of claim 1, wherein a distance between the light beam and a thread disposed in the textile sewing apparatus comprises a range between approximately 10 millimeters and approximately 25 millimeters.

13. (Original) The system of claim 1, wherein the textile sewing apparatus comprises a carpet tufting apparatus comprising a yarn guide plate and a needle bar.

14. (Original) The system of claim 13, wherein the emitter is disposed proximate to the yarn guide plate.

15. (Original) The system of claim 13, wherein the emitter is disposed proximate to the needle bar.

16. (currently amended) The system of claim 1, wherein a distance between the emitter and the receiver ~~comprises a range between~~ is greater than approximately 1 meter ~~and approximately 4 meters~~.

17. (currently amended) A method of detecting thread breakage in a textile sewing apparatus, the method comprising:

providing a textile sewing apparatus having at least one yarn guide plate defining a plurality of holes through which thread may pass;

providing a thread breakage detection apparatus coupled to the textile sewing apparatus, the thread breakage detection apparatus comprising:

~~providing~~ a light source operable to generate a light beam;

~~providing~~ an emitter operable to emit the light beam, the emitter comprising an emitter lens ~~and a first fiber optic cable comprising proximate and distal ends, the proximate end of the first fiber optic cable in communication with the light source and the distal end of the first fiber optic cable in communication with the emitter lens~~; and

~~providing~~ a receiver operable to receive the light beam and to communicate the light beam to a sensor, the receiver comprising a receiving lens ~~and a second fiber optic cable comprising proximate and distal ends, the proximate end of the second fiber optic cable in communication with the receiving lens and the distal end of the second fiber optic cable in communication with the sensor, the receiving lens~~ disposed in facing opposition to the emitter lens, wherein in order to minimize false positives:

the light beam is proximate to the yarn guide plate, and

a distance between the light beam and a thread disposed in one of the plurality of holes defined by the yarn guide plate comprises approximately 10 millimeters.

18. (Original) The method of claim 17, further comprising providing the emitter in communication with the light source and the receiver.

19. (Original) The method of claim 17, wherein the receiving lens comprises a diameter substantially equal to or less than a diameter of a thread disposed in the textile sewing apparatus.

20. (Original) The method of claim 17, wherein the receiving lens is operable to focus the light beam on a surface of the proximate end of the second fiber optic cable.

21. (Original) The method of claim 17, further comprising providing a first processor and a second processor, the first processor in communication with the light source, the sensor, and the second processor, the second processor operable to control the textile sewing apparatus.

22. (Original) The method of claim 21, wherein the second processor comprises a relay.

23. (Original) The method of claim 21, wherein the second processor comprises a microprocessor.

24. (Original) The method of claim 21, wherein the first processor is operable to associate a first value with a quantity of light emitted from the emitter and to associate a second value with a quantity of light received by the receiver.

25. (Original) The method of claim 24, wherein the first processor is operable to compare the first and second values.

26. (Original) The method of claim 25, wherein the first processor is operable to generate a signal associated with the comparison of the first and second values and to communicate the signal to the second processor.

27. (currently amended) A thread breakage detecting apparatus adapted to be coupled to a textile sewing apparatus, the thread breakage detecting apparatus comprising:

a light source operable to generate a light beam;

an emitter in communication with the light source, the emitter operable to emit the light beam, the emitter comprising an emitter ~~lens and a first fiber optic cable comprising proximate and distal ends, the proximate end of the first fiber optic cable in communication with the light source and the distal end of the first fiber optic cable in communication with the emitter lens~~; and

a receiver in communication with the emitter, the receiver operable to receive the light beam and to communicate the light beam to a sensor, the receiver comprising a receiving lens ~~and a second fiber optic cable comprising proximate and distal ends, the proximate end of the second fiber optic cable in communication with the receiving lens and the distal end of the second fiber optic cable in communication with the sensor, the receiving lens~~ disposed in facing opposition to the emitter lens, wherein in order to minimize false positives:

the light beam is proximate to a yarn guide plate of the sewing apparatus, the yarn guide plate defining a plurality of holes through which thread may pass, and

a distance between the light beam and a thread disposed in one of the plurality of holes defined by the yarn guide plate comprises approximately 10 millimeters.

28. (Original) The apparatus of claim 27, wherein the receiving lens comprises a diameter, the diameter substantially equal to or less than a diameter of a thread disposed in the textile sewing apparatus.

29. (Original) The apparatus of claim 27, wherein the receiving lens is operable to focus the light beam on a surface of the proximate end of the second fiber optic cable.

30. (Original) The apparatus of claim 27, further comprising a processor in communication with the light source and the sensor, the processor operable to associate a first value with a quantity of light emitted from the emitter and a second value with a quantity of light received by the receiver.

31. (Original) The apparatus of claim 30, wherein the processor is operable to compare the first and second values and to generate a signal associated with the comparison of the first and second values, the signal operable to control the textile sewing apparatus.

32. (Currently Amended) The apparatus of claim 27, wherein a distance between the emitter and the receiver ~~comprises a range between~~ is greater than approximately 1 meter ~~and approximately 4 meters~~.

33. (currently amended) ~~A system comprising~~ The system of claim 1, further comprising:

~~a textile sewing apparatus; and~~

~~a thread breakage detection apparatus coupled to the textile sewing apparatus, the thread breakage detection apparatus comprising:~~

~~a light source;~~

~~an emitter comprising an emitter lens and a first fiber optic cable comprising proximate and distal ends, the proximate end of the first fiber optic cable in communication with the light source and the distal end of the first fiber optic cable in communication with the emitter lens;~~

~~a receiver operable to receive the light beam emitted from the emitter and to communicate the light beam to a sensor, the receiver comprising a receiving lens and a second fiber optic cable comprising proximate and distal ends, the proximate end of the second fiber optic cable in communication with the receiving lens and the distal end of the second fiber optic cable in communication with the sensor, the receiving lens disposed in facing opposition to the emitter lens; and~~

a processor in communication with the emitter and the receiver, the processor operable to associate a first value with a quantity of light emitted from the emitter and a second value with a quantity of light received by the receiver.

34. (new) The method of claim 1, wherein the emitter lens comprises an effective depth of approximately 3.6 millimeters and a spot facing depth of approximately 0.9 millimeters.

35. (new) A system comprising:

a textile sewing apparatus having at least one yarn guide plate defining a plurality of holes through which thread may pass; and

a thread breakage detection apparatus coupled to the textile sewing apparatus, the thread breakage detection apparatus comprising:

a light source operable to generate a light beam;

an emitter in communication with the light source, the emitter operable to emit the light beam, the emitter comprising an emitter lens; and

a receiver in communication with the emitter, the receiver operable to receive the light beam emitted from the emitter and to communicate the light beam to a sensor, the receiver comprising a receiving lens disposed in facing opposition to the emitter lens, wherein in order to minimize false positives:

the light beam is proximate to the yarn guide plate, and

a distance between the light beam and a thread disposed in one of the plurality of holes defined by the yarn guide plate comprises a range between approximately 10 millimeters and approximately 25 millimeters.